

Repeated Integration by Parts (Section 7.2 Part 2)

Warm-up:

1. Evaluate from memory: $\int \ln x dx$

2. Evaluate using integration by parts (and u-substitution): $\int xe^{-5x} dx$

Repeated Integration by Parts

Example 1: Evaluate $\int x^2 e^{-x} dx$

Example 2: $\int e^x \cos x dx$

A Tabular Method for Repeated Integration by Parts

This method can be used for integrals of the form _____,
where $p(x)$ is a _____.

Steps for Tabular Integration by Parts:

1. _____
2. _____
3. _____
4. _____
5. _____

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Example 3: Evaluate $\int (x^2 - x) \cos x dx$

Practice Problem 1: Redo Example 1 using tabular integration by parts: $\int x^2 e^{-x} dx$

Practice Problem 2: Evaluate $\int x^2 \sqrt{x-1} dx$ using tabular integration by parts.

Example 4: Use integration by parts to evaluate the integral $\int_0^{\pi/6} x \sin 3x dx$